SAFETY AND BUILDINGS DIVISION
Plumbing Product Review
P.O. Box 2658
Madison, Wisconsin 53701-2658
TTY: Contact Through Relay

Scott Walker, Governor
Dave Ross, Secretary

December 20, 2011

KRISTAR ENTERPRISES, INC.
MICHAEL KIMBERLAIN
360 SUTTON PL
SANTA ROSA CA 95407

Re: Description: STORMWATER TREATMENT DEVICE
Manufacturer: KRISTAR ENTERPRISES, INC.
Product Name: FloGard® DUAL-VORTEX HYDRODYNAMIC SEPARATOR
Model Number(s): **DVS-48C and DVS-48S**
Description: post-construction, stormwater control device inserted in a 48-inch diameter concrete vault; vortex gravity separator; max. treatment capacity 0.75 cfs; 0.7 cu yd. sediment storage; 43 gal. oil/floatable storage
Product File No: 20110371

The specifications and/or plans for this plumbing product have been reviewed and determined to be in compliance with chapters SPS 382 through 384, Wisconsin Administrative Code, and Chapters 145 and 160, Wisconsin Statutes.

The Department hereby issues an approval based on the Wisconsin Statutes and the Wisconsin Administrative Code. **This approval is valid until the end of MAY 2017.**

This approval is contingent upon compliance with the following stipulation(s):

- A plumbing plan must be submitted and approved prior to each proposed installation in accordance with S. DSPS 382.20 (1) (a) 2. A Plumbing Plan Review must be successfully completed prior to each proposed installation. A minimum of four sets of completed plans and specifications, signed by a Wisconsin registered Architect, Designer, Engineer or licensed Master Plumber shall be submitted along with the following specific information:
  a. A "Plumbing Plan Review Application" (i.e. SBD-6154) and required fee;
  b. A scaled plot plan;
  c. A scaled floor plan;
  d. A drain, waste and vent system (i.e. DWV) isometric drawing for the engineered blackwater/graywater system;
  e. A non-potable water system isometric drawing;
  f. A potable water system isometric drawing;
  g. A maintenance manual addressing all serviceable components or systems;
  h. A written contingency plan; and
  i. Water calculation worksheets:
    1. The complete non-potable water system; and
    2. The complete potable water system
  j. A copy of this approval letter
  For system installations that include irrigation and/or inflitration, the folllowing information must also be provided:
  k. The soil type; and
  l. Infiltration rate
  After the plan review process is complete, and the installation is finished, the State Plumbing Consultant assigned to the county in which the installation is located, shall inspect the completed installation. The final installation shall be completed and passed before the system is put into service.
  Some of the information listed previously may not pertain to a specific installation.

- Any wastewater or waste materials (e.g. sludge, scum) withdrawn from these systems must be disposed of in accordance with ch. NR 113.

- Prior to installation of this product, plans and specifications must be submitted to the department or to an approved agent municipality for review and approval in accordance with s. DSPS 382.20 (1) of the Wis. Admin. Code. Written approval for the plans and specifications shall be obtained prior to installation of the product.

- This product is approved for the following use:
  -- Stormwater and clearwater treatment for uses so listed in Table DSPS 382.70-1, for subsurface infiltration.

- All manholes shall be grouted and sealed as per manufacturer's recommendations and tested for water tightness prior to operation.

- The review undertaken by department staff does not include review and/or approval of this submittal as meeting DNR specifications for ch. NR 151.

- This product submittal has been reviewed and approved for plumbing treatment standards for subsurface infiltration and irrigation using stormwater as the source, as listed in Table DSPS 382.70-1.

- When this product is installed, the installation must be in accordance with the manufacturer's printed design installation instructions, ch. DSPS 382, plan approval under s. DSPS 382.20, and any product approval stipulations. When there is a conflict between manufacturer's installation instructions and plan approval conditions or product approval stipulations, the plan approval conditions or product approval stipulations will take precedence.

- This product is expected to provide treatment as specified in Tables 1 and 2, entitled Stormwater Treatment for KriStar FloGard DVS-48.

Table 1
Stormwater Treatment for KriStar FloGard DVS-48 with
US Silica OK-110 for Suspended Solid

Percent of Maximum Hydraulic Capacity	Maximum Flow in cu. ft./sec.	Influent Quality in mg/L	Effluent Quality in mg/L	Percent Efficiency
125.0	1.248	200	125.2	38.4
99.6	0.996	200	105.7	48.7
74.9	0.749	200	74.5	62.4
50.1	0.499	200	45.8	76.9
25.2	0.252	200	8.6	95.9
10.0	0.100	200	0.7	99.6

Table 2
Stormwater Treatment for KriStar FloGard DVS-48 with
US Silica F-110 for Suspended Solid

Maximum Flow in cu. ft./sec.	Influent Quality in mg/L	Effluent Quality in mg/L	Percent Efficiency
0.41	150.0	27.3	81.8
0.79	156.0	70.2	51.1
1.21	138.0	115.8	24.8

- A copy of the manufacturer's installation instructions must be given to the property owner, installer and submitted along with other information required by the governing agency for the installation.

- Inspection, maintenance and cleaning of this product must be performed at intervals specified by the manufacturer in KriStar "General Specifications for Maintenance of FloGard ® Dual-vortex Hydrodynamic Separator, dated 11/04" that requires service prior to and after snow season, or in accordance with plan approval, or s. DSPS 382.21, whichever is more restrictive.

- This product submittal has been reviewed and approved for plumbing treatment standards for subsurface infiltration and irrigation using stormwater as the source, as listed in Table DSPS 382.70-1. Each site-specific installation shall be submitted for review and include acceptable methods, modeling , or analysis to predict efficiency for TSS and oil & grease removal.

- This manhole riser/catch basin must be designed to withstand the loads to which it will be subjected. All manhole covers terminating above grade must have effective locking devices.

- Maximum storage capacity: total sediment storage—0.7 cubic yards; oil storage—70 gallons.

  Maximum flow rates: design flow—0.7 cfs; peak treatment flow—3.0 cfs; peak siphonic bypass— 3.0 cfs; head loss—6.0 inches.

- **Any plumbing plans that include this device(s) and submitted to the department (or its agents) shall be accompanied by an acceptable modeling method, such as outlined in Method for Predicting the Efficiency of**
  Proprietary Storm Water Sedimentation Devices (1006) for the specific site where the installation of this device(s) is planned. The submitted calculations, based on site-specific inputs, shall predict the removal efficiencies by concentration and percentage. For particle size distribution, in SLAMM use file: NURP.cpz.
  For a copy of this standard, see:
  http://dnr.wi.gov/runoff/pdf/stormwater/techstds/prop_devices_std_v2_051408.pdf

- **Any plumbing plans that include this device(s) and submitted to the department (or its agents) shall be accompanied by an acceptable modeling analysis for the specific site where the installation of this device(s) is planned. The submitted calculations, based on site-specific inputs, shall predict the removal efficiencies by concentration and percentage for both TSS and O&G. For particle size distribution, use the EPA-NURP (National Urban Runoff Program] distribution.**

- Additional information is included as attachment(s) to this letter; see attachment A, B and C.

This approval supersedes the approval issued on 5/16/2007 under product file number 20060465.

This approval letter shall be incorporated with your previously approved plans and/or specifications approved under product file number 20060465.

The department is in no way endorsing this product or any advertising, and is not responsible for any situation which may result from its use.

Sincerely,

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